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Title: Reservoir for blood samples

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Documents taken into account for evaluating the patentability:

Nothing dectected

1.75 409 583/344

Patent Claims:

1. Reservoir used to incorporate smallest amounts of blood from capillaries characterized by a tubular body (1) which is closed at its lower end, the interior of which is divided via a parting wall (2) into a side pocket (3) for taking up one or more small capillary tubes (4) and a central space (5), which narrows conically towards its lower end and leads into a collecting pocket (6) having a spherical cross-section, wherein the bottom of the side pocket (3) is positioned above the upper edge of the collecting pocket (6) and the parting wall does not reach as far as to the bottom of the side pocket by leaving a connection between the side pocket and the central space.
2. Reservoir according to claim 1, characterized in that the bottom of the side pocket (3) declines towards the central space.
3. Reservoir according to claims 1 and 2, characterized in that the parting wall (2) is formed by a rectangular sheet, which is removably inserted into two guiding slots (7) of the body (1).

The invention relates to a reservoir used to incorporate smallest amounts of blood from capillaries.

The micromethods of examining serum or plasma are developed to such a great extent that only very small amounts of blood are required. If, nevertheless, still in many cases larger amounts of blood are taken from the patient, this is done because the handling of smallest amounts below one cubic centimetre, and particularly the production of serum or plasma from these amounts of blood, causes certain difficulties.

However, in certain cases it was refrained from taking larger amounts of blood and the blood was taken from a smaller cut or prick wound with the help of small capillary tubes, which fill themselves according to the known capillary effect.

So far it has been practice to either blow out the content of these small tubes by mouth or a special blowing device into a microvessel. This method is either dangerous for the person performing the method or cannot be conducted so easily without losing further parts of the small amounts of blood.

Further, the preheated capillaries were sealed at their lower end either by sticking together or welding with a micro Bunsen burner. A centrifugation process followed and the serum was sucked off from the top of this small capillary tube by a micropipette. Also here, the handling is rendered extremely difficult and one cannot succeed in obtaining the amount of serum or plasma without losses.

The invention is based on the object of providing a device with the help of which such small capillary tubes filled with patients' blood can be emptied quantitatively in such a way that the blood extracted from the capillaries can subsequently either be converted into serum or plasma and the liquid can be extracted with a micropipette without difficulties.

This object is accomplished according to the invention with the help of a reservoir used to incorporate smallest amounts of blood from capillaries characterized by a tubular body, which is closed at its lower end, the interior of which is divided via a parting wall into a side pocket for taking up one or more small capillary tubes and a central space, which narrows conically towards its lower end and leads into a collecting pocket having a spherical cross-section, wherein the bottom of the side pocket is positioned above the upper edge of the collecting pocket and the parting wall does not reach as far as to the bottom of the side pocket by leaving a connection between the side pocket and the central space. The shape and dimensions of this reservoir are designed in such a way that it can be fitted into a centrifuge. The side pocket is charged with the small capillary tubes filled with blood and the reservoir is optionally sealed at the top with a closure stopper. Then centrifugation is carried out during which the blood contained in the capillary pours out downwards practically quantitatively, flows over the

bottom of the side pocket and the connection between the side pocket and the central space into the central space, where it accumulates in the collecting pocket.

The small capillary tubes can either be lined with an anticoagulant at their inner wall. Thus, coagulation of the blood taken from the patient is avoided, and the plasma is deposited in the collecting pocket of the reservoir during centrifugation. Or, if the capillaries are not lined with an anticoagulant, the blood, which poured out of the capillaries and accumulated in the collecting pocket of the reservoir, will coagulate there and optionally another centrifugation process is carried out so that the serum is deposited. As was shown in experiments, the blood can also coagulate in the capillaries and then cruor and serum can be transferred from the capillaries to the collecting pocket during centrifugation, hence only one centrifugation process is required.

At any rate, the liquid remaining in the collecting pocket, i.e. the plasma or serum, can later be extracted with the help of a micropipette and be further examined.

Preferably, the bottom of the side pocket is declined towards the central space so as to facilitate the pouring out from the side pocket into the collecting pocket.

The parting wall can either be solid and indissolubly installed in the reservoir. Or, as is preferred, the parting wall is formed by a rectangular sheet, which is removably inserted into two guiding slots of the body of the reservoir. Corresponding stops in the guiding slots ensure that the parting wall does not rest on the bottom of the side pocket, but leaves a connecting tunnel between the side pocket and the central space.

The reservoir can basically be produced of any material which is generally suited to incorporate blood, wherein of course transparent materials such as glass are preferred. However, preferably the reservoir is produced of a transparent synthetic material, e.g. polystyrene. The advantage of such a polystyrene reservoir over a glass vessel is that the walls are not covered with blood or serum or plasma, respectively, and consequently a quantitative extraction is possible.

In the following the invention is further explained in one example according to the drawing.

The figures show:

Fig. 1 shows a cross-section through a reservoir according to the invention,

Fig. 2 shows a top view of the upper end of the reservoir in Fig. 1,

Fig. 3 shows a section along line III-III in Fig. 2,

Fig. 4 shows a section along line IV-IV in Fig. 3,

Fig. 5 shows a section along line V-V in Fig. 2 and

Fig. 6 shows a section similar as in Fig. 1 through a reservoir after centrifugation, wherein extraction with a micropipette device is indicated.

Reservoir 1 is a tubular body comprising central space 5 and side pocket 3 separated therefrom by parting wall 3, which side pocket serves to take up one or more small capillary tubes 4.

The bottom of side pocket 3 declines towards central space 5. The central space narrows conically towards its lower end and leads into collecting pocket 6 having a spherical cross-section.

Parting wall 2 is a rectangular sheet, which is inserted into the two guiding slots 7 of the body of reservoir 1.

The top of the reservoir is formed in such a way that it can be sealed with a closure stopper (not shown).

Additionally, its shape and dimensions are that of a small centrifugation tube, thus it can be fitted into common centrifuges.

As can be taken from Fig. 6, the blood poured out of capillaries 4 accumulates in collecting pocket 6 at the lower end of central space 5. This amount of blood 8 and the serum or plasma

formed therefrom are then extracted with the top of pipette 9, which is inserted in central space 5, fitted into a known micropipette device 10 thereby reaching the bottom of collecting pocket 6.

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2 drawing pages to follow

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Fig. 1

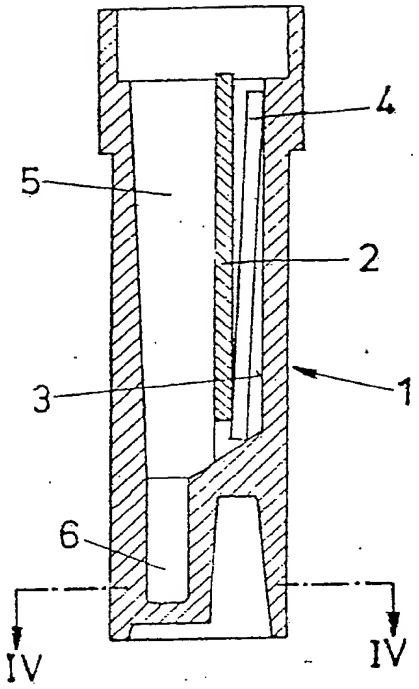


Fig. 3

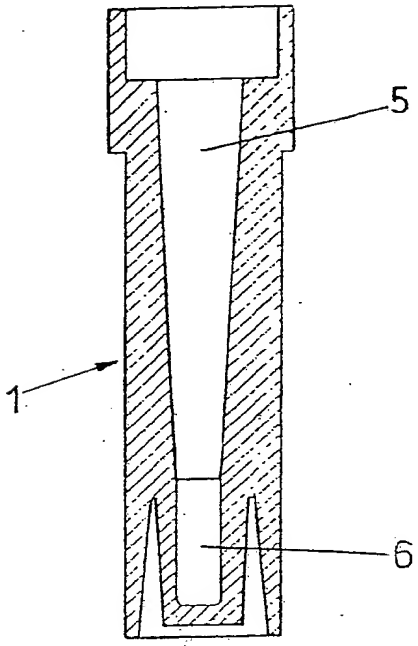
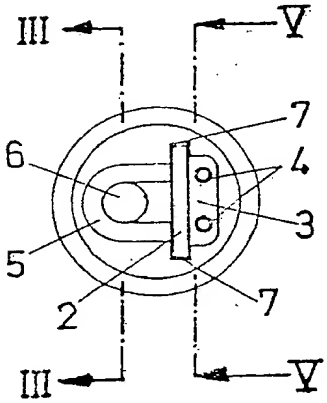


Fig.2



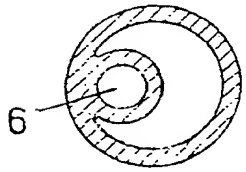


Fig.4

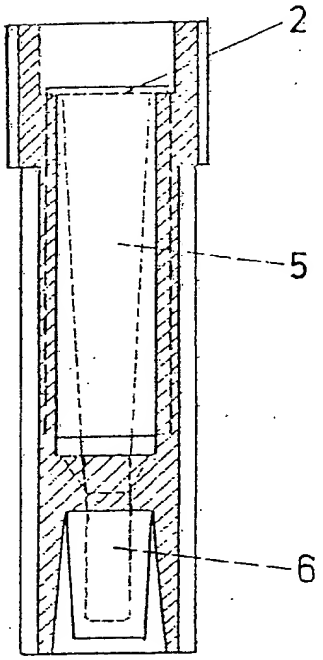


Fig. 5

DRAWING PAGE 2

Number: 23 43 987
Int. Cl.: G 01 N 33-16
Date of Publication: January 16, 1975

Fig. 6